

JP 11-130938

5/18/99

AN 1999:312821 CAPLUS
 DN 131:6320
 TI Epoxy resin compositions having good warping, soldering, and thermal shock

resistance and high-temperature storage stability and their use in semiconductor devices

IN Sameshima, Kenji
 PA Sumitomo Bakelite Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 15 pp.
 CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L063-00

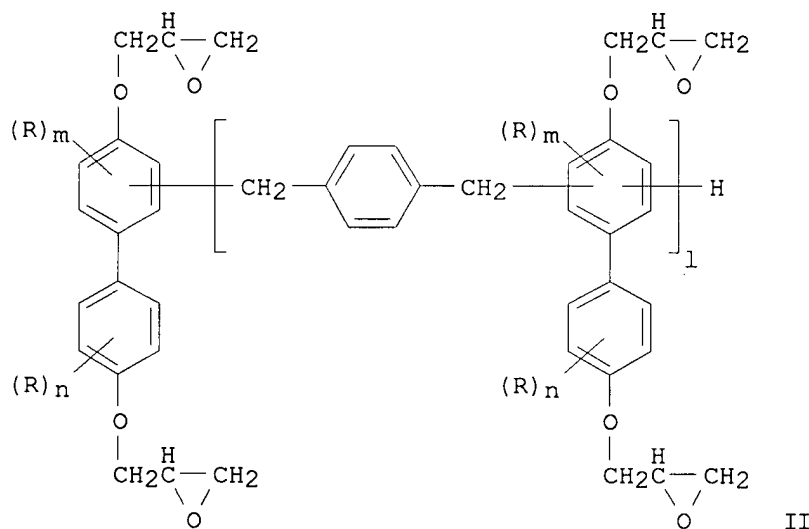
ICS C08L063-00; C08G059-24; C08G059-32; C08G059-62; C08K003-02; C08K003-36; C08K009-02; C08K009-04; H01L023-29; H01L023-31

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 37, 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
0 PI	JP 11130938	A2	19990518	JP 1997-296976	19971029
GI					



AB The compns. for packaging semiconductors comprise (A) multifunctional epoxy resins $\text{GOC}_6\text{H}_4\text{-mRm}[\text{CH}[\text{C}_6\text{H}_4\text{-n(Rn)OG}]\text{C}_6\text{H}_3\text{-m(Rm)OG}]\text{lH}$ (I) and/or $\text{MeC}[\text{C}_6\text{H}_4\text{-n(Rn)OG}]\text{2C}_6\text{H}_4\text{-p-CMe2Q1OG}$ (R = same or different halo, C1-12 alkyl; G = glycidyl; Q1 = Rn-substituted 1,4-phenylene; l = 1-10; m = 0-3; n = 0-4) and/or cryst. epoxy resins having m.p. 50-150.degree. selected from GOQ2OG, GOQOG, GOQCR':CR'QOG, GOQCH2QOG, and II [R' = same or different H, R; Q = p-C6R'4; R, Q1, l, m, and n are same as above], (B) phenolic resin curing agents $\text{HOC}_6\text{H}_4\text{-mRm}[\text{CH}[\text{C}_6\text{H}_4\text{-n(Rn)OH}]\text{C}_6\text{H}_3\text{-m(Rm)OH}]\text{lH}$ (III) (R, l, m, and n are same as above), (C) curing accelerators, (D) fused SiO2 powders, and (E) 0.3-5.0% (based on total compns.) red phosphorus-based fireproofing agents. Substantially, only a semiconductor

TPP
 ↓ warpage

element-mounted side of a substrate is sealed with the compns. in the
 devices. Thus, a compn. contg. Epikote 1032H (I, m = n = 0) 4.6, YX
 4000H (3,3',5,5'-tetramethyl-4,4'-diglycidylxybiphenyl, m.p. 105.degree.) 4.6,
MEH 7500 (III m = n = 0) 4.8, a fireproofing agent [obtained by coating
red P with Al(OH)₃ and then with a phenolic resin] 1.0, Ph3P 0.2,
 spherical fused SiO₂ 84.0 parts, and other additives was used to seal a
 semiconductor element to give a test piece showing good storage stability
 at 175.degree..

ST cryst epoxy resin semiconductor device packaging; warping resistance
 epoxy
 resin semiconductor packaging; storage stability epoxy resin
 semiconductor
 packaging; soldering resistance epoxy resin semiconductor packaging;
 thermal shock resistance epoxy resin semiconductor; phenolic resin curing
 agent epoxy resin; fused silica epoxy resin semiconductor packaging; red
 phosphorus fireproofing agent epoxy resin

IT Electronic packaging materials
 Heat-resistant materials
 Semiconductor devices
 (epoxy resin compns. with good warping, soldering, and thermal shock
 resistance and high-temp. storage stability for packaging
 semiconductor
 devices)

IT Phenolic resins, uses
 Phenolic resins, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); POF
 (Polymer
 in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
 (epoxy; epoxy resin compns. with good warping, soldering, and thermal
 shock resistance and high-temp. storage stability for packaging
 semiconductor devices)

IT Phenolic resins, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (fireproofing agent component; epoxy resin compns. with good warping,
 soldering, and thermal shock resistance and high-temp. storage
 stability for packaging semiconductor devices)

IT Phenolic resins, uses
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (novolak, crosslinking agent; epoxy resin compns. with good warping,
 soldering, and thermal shock resistance and high-temp. storage
 stability for packaging semiconductor devices)

IT Epoxy resins, uses
 Epoxy resins, uses
 RL: DEV (Device component use); IMF (Industrial manufacture); POF
 (Polymer
 in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
 (phenolic; epoxy resin compns. with good warping, soldering, and
 thermal shock resistance and high-temp. storage stability for
 packaging
 semiconductor devices)

IT Fireproofing agents
 (red phosphorus-based; epoxy resin compns. with good warping,
 soldering, and thermal shock resistance and high-temp. storage
 stability for packaging semiconductor devices)

IT **112755-07-4, MEH 7500**
 RL: DEV (Device component use); MOA (Modifier or additive use); USES

(Uses)
 (crosslinking agent; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT 603-35-0, Triphenylphosphine, uses
 RL: CAT (Catalyst use); USES (Uses)
 (curing accelerator; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT 222053-12-5DP, polymers with phenolic resins 223591-58-0P
 223591-60-4P
 223591-61-5P 223591-62-6P 223596-22-3P
 RL: DEV (Device component use); IMF (Industrial manufacture); POF (Polymer in formulation); PRP (Properties); PREP (Preparation); USES (Uses)
 (epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT 60676-86-0, Fused silica
 RL: MOA (Modifier or additive use); USES (Uses)
 (epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT 7723-14-0, Red phosphorus, uses 21645-51-2, Aluminum hydroxide, uses
 RL: MOA (Modifier or additive use); USES (Uses)
 (fireproofing agent component; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)

IT **174882-88-3**, Epikote 1032H
 RL: DEV (Device component use); POF (Polymer in formulation); PRP (Properties); USES (Uses)
 (hydroxybenzaldehyde-phenol copolymer- and novolak-crosslinked; epoxy resin compns. with good warping, soldering, and thermal shock resistance and high-temp. storage stability for packaging semiconductor devices)